US006594198B2

(12) **United States Patent**
Amaral et al.

(10) **Patent No.: US 6,594,198 B2**
(45) **Date of Patent: Jul. 15, 2003**

(54) **DIGITAL SIGNAL DEMODULATOR CALIBRATION SYSTEM AND METHOD FOR OPTICAL HYDROPHONES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/977,904**

(22) Filed: **Oct. 10, 2001**

(65) **Prior Publication Data**

US 2003/0067841 A1 Apr. 10, 2003

(51) **Int. Cl.**[7] **H04B 17/00**; H04R 7/00
(52) **U.S. Cl.** **367/13**; 367/149
(58) **Field of Search** 367/13, 149; 342/194

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(57) **ABSTRACT**

A system for digitally demodulating optical hydrophone signals is provided. The system includes an optical hydrophone connected to an analog-to-digital converter and further connected to a digital signal processor. Within the digital signal processor, a demodulator is calibrated by a preferred automatic calibration circuit such that mixer frequencies are coherently mixed with the incoming acoustic signals received by the hydrophone. The automatic calibration circuit preferably determines an extreme case of phase offset by following a programmable routine including a series of tests. After the extreme case is detected, the precise phase calibration is known and provided to the demodulator mixer tables. The automatic calibration circuit can be utilized for automatic calibrations of multisensor systems containing large numbers of hydrophones.

11 Claims, 5 Drawing Sheets